REMARKS

Claims 1-3 and 7-19 are pending in the present application. Claims 17-19 are withdrawn. Claims 1-3 and 7-16 are rejected. Claims 1-3 and 16 are amended and new claims 20-23 are added herein.

Claim Rejections under 35 U.S.C. §102(b)

Claims 1-3 and 7-16 are rejected under 35 U.S.C. §102(b) as being anticipated by Fukushima et al. (U.S. Patent No. 5,986,301).

Applicants respectfully disagree with the rejection, and submit that the Examiner has mischaracterized the relationship between the claimed invention and the cited reference.

In the present invention, the reason why the intermediate layer is formed between the electrode and the ferroelectric film is the use of inexpensive base metal film as the electrode. The base metal film is a film which is not self-aligned easily. Therefore, in a case that the ferroelectric film is formed directly on the electrode, crystal directions of the ferroelectric film are not aligned easily. Accordingly, in the case that the ferroelectric film is formed directly on the electrode of the base metal film, it is difficult to form the ferroelectric film having good perovskite crystal structure. Furthermore, oxygen etc. in the ferroelectric film tends to be diffused in the electrode of the base metal film. In the present invention, since the intermediate layer of perovskite crystal structure is formed between the electrode and ferroelectric film, it is possible to form the ferroelectric film having good perovskite crystal structure, even in the case that base metal film is used as the electrode.

Applicants note the Examiner's statement on page 2, line 11 of the office communication that the bottom electrode 242 of Fukushima et al. corresponds to the first electrode of the present invention. Applicants respectfully disagree with this conclusion.

Applicants note that in the present invention, the first electrode 32 is an electrode of a base metal. As confirmed in the specification on page 11, lines 20-23, "base metal" is a term opposed to noble metal, and means metals that are not chemically stable, tend to be oxidized by heating in air and have high ionization tendency, such as Ni, Cu or Cr.

On the other hand, in Fukushima et al., the bottom electrode 242 is made of a conductive oxide material having a perovskite structure. For reference purposes, Applicants include herewith an attachment that includes comparison of Figs. A and B.

Therefore, Applicants submit that the bottom electrode 242 of Fukushima et al. does not correspond to the first electrode 32 of the present invention.

On lines 13-14 of page 2 of the office communication, the Examiner states that the top electrode 244 of Fukushima et al. corresponds to the second electrode of the present invention. Applicants respectfully submit that the Examiner's statement is incorrect.

Applicants note that in the present invention, the second electrode 40 is an electrode of a base metal, as clarified above. Therefore, the top electrode 244 of Fukushima et al. does not correspond to the second electrode 40 of the present invention.

On lines 15-16 of page 2 of the office communication, the Examiner states that Fukushima et al. teaches an intermediate layer of perovskite crystal structure formed at the boundary between the first electrode, the ferroelectric film and the second electrode, as noted in the abstract, lines 1-5. Applicants respectfully submit that the Examiner's statement is incorrect.

Applicants note that in lines 1-5 of the abstract of Fukushima et al., Fukushima et al. describes only the bottom electrode 242, the dielectric film 243 and the top electrode 244 (see Fig. B in the attached paper).

Applicants submit that Fukushima et al. neither teaches nor suggests an intermediate layer that corresponds to the intermediate layer 34, 38 of the present invention, as shown in Fig. A in the attached paper.

In "Response to Arguments" of the office communication, the Examiner states that Fukushima et al. describes the perovskite material containing Ti on Col. 7, lines 15-25.

However, Applicants note that the perovskite material containing Ti of Fukushima et al. is a ferroelectric film 243 of $Ba_xSr_{1-x}TiO_3$ (BSTO). The ferroelectric film 243 of the Fukushima et al. does not correspond to the intermediate layer 34, 38 of the present invention, as indicated in Figs. A and B in the attached paper.

On lines 3-5 of page 3 of the office communication, the Examiner states that Fukushima et al. teaches that the metal is Ni (col. 17, lines 35-45). Applicants respectfully submit that the Examiner's statement is incorrect.

On lines 35-45 of Column 17 of Fukushima et al, Ni is applied as a material of a bottom electrode 242, 244 of $PrNiO_3$ and the top electrode 244 of $PrNiO_3$. The electrode 242, 244 of $PrNiO_3$ is not an electrode of a base metal. Therefore, the electrodes 242, 244 of Fukushima et al. do not correspond to the electrodes 32, 40 of the present invention.

Fukushima et al. discloses only a device comprising a bottom electrode 242 of conductive oxide material having a perovskite structure, a ferroelectric film 243 formed on a bottom electrode 242, and a top electrode 244 of conductive oxide material having a perovskite structure formed on the ferroelectric film 243.

In the present invention, the reason why the intermediate layer is formed between the electrode and the ferroelectric film is the use of inexpensive base metal film as the electrode. The base metal film is a film which is not self-aligned easily. Therefore, in a case that the ferroelectric film is formed directly on the electrode, crystal directions of the ferroelectric film are not aligned easily. Accordingly, in the case that the ferroelectric film is formed directly on the electrode of the base metal film, it is difficult to form the ferroelectric film having good perovskite crystal structure. Furthermore, oxygen etc. in the ferroelectric film tends to be diffused in the electrode of the base metal film. In the present invention, since the intermediate layer of perovskite crystal structure is formed between the electrode and ferroelectric film, it is possible to form the ferroelectric film having good perovskite crystal structure, even in the case that base metal film is used as the electrode. Applicants submit that Fukushima et al. neither teaches nor suggests such feature of the present invention.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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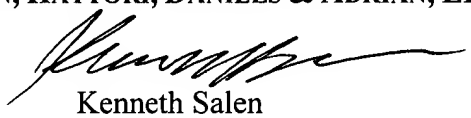

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Attachment: Figs. A and B Comparing Present Invention with that of Fukushima et al.

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